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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/054,125	01/22/2002	Collin A. Rich	10989-007	6416

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EXAMINER
MALLARI, PATRICIA C

ART UNIT	PAPER NUMBER
3736	4

DATE MAILED: 04/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/054,125	RICH ET AL.
	Examiner	Art Unit
	Patricia C. Mallari	3736

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 January 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *26* is/are allowed.

6)☒ Claim(s) *1-5,7-9,11,13,22-25,27,29 and 30-35* is/are rejected.

7)☒ Claim(s) *6,10,12,14-21 and 28* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 January 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

Claims 21 and 32 are objected to because of the following informalities: on line 2 of claim 21 and line 3 of claim 32, "wirebond" should be replaced with "wire bond". Appropriate correction is required.

Claims 28-31 and 33-35 are objected to because of the following informalities: "the placing" on line 1 of each of the claims should be replaced with "placing". Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 7-9, 11,13, 24, 25, 27, 29, 30 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Urion et al. Urion describes an intrauterine pressure catheter system 10 with a pressure sensor 20 embedded in a tip 52 of a catheter 50. Sensor 20 is a conventional, miniature silicon diaphragm pressure sensor having a thin diagphragm that can be deflected by the pressure pulses traveling through the uterine fluid. Electronic circuitry configured to generate an electrical signal representing the pressure exerted on the diaphragm is also provided. A suitable sensor 20 includes a piezoresistive strain gauge implant, thin-film temperature compensation element, and calibration element al integrated on a single monolithic,

semiconductor die (substrate) 22 encased in housing 24. Sensor 20 has an orifice 26 protruding from the top of the housing 24 over die 22. Silicon dielectric gel 28 fills the orifice 26. A membrane (sealant) may be placed over orifice 26 to retain silicon gel 28. Leads 32 electrically connect die 22 to a number of electrical connector pins 30, which are electrically connected via solder 34 to a corresponding number of wires 36. Typically, a bundle of four wires 36, each having Teflon insulation (shielded), comprise leadwire cable 40 traveling away from sensor 20 through port 42 of armature 46. Sensor 20 is mounted in a fixed, rigid manner within the tip 52 of the catheter 50. Catheter 50 has cable lumen 84 and amnio lumen 86. Leadwire cable 40 from sensor 20 travels through cable lumen 84 and ends in female connector socket 162 of connector assembly 160 (figs. 2-6, 12a-c, and 13).

Claims 1-5 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Wise et al. Wise describes an ultraminiature pressure sensor 30 having a patterned glass support substrate 32 selectively metallized in certain areas, a patterned silicon transducer chip 34, and an interface circuit chip 36. The glass substrate has formed therein two grooves 40 and 42 at the left end 44 of the substrate 32 and a second pair of grooves 46 and 48 at the right end 50 of the substrate 32. Formed just beyond the inner end of the groove 40 and 42 are metallized bonding pads 60 and 62. Similarly, just beyond the inner ends of grooves 46 and 48 are metallized bonding pads 66 and 68. Grooves 40, 42, 46, and 48 are metallized and electrically connected respectively to pads 60, 62, 66, and 68. Grooves 40, 42, 46, and 48 receive wires 70, 72, 76, and 78 respectively, which are soldered or otherwise secured to the grooves (fig. 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Urion et al. in view of Wise et al. Urion et al. describes an intrauterine pressure catheter system 10 with a pressure sensor 20 embedded in a tip 52 of a catheter 50. A suitable sensor 20 includes a piezoresistive strain gauge implant, thin-film temperature compensation element, and calibration element al integrated on a single monolithic, semiconductor die (substrate) 22 encased in housing 24. Sensor 20 has an orifice 26 protruding from the top of the housing 24 over die 22. Silicon dielectric gel 28 fills the orifice 26. A membrane (sealant) may be placed over orifice 26 to retain silicon gel 28. Leads 32 electrically connect die 22 to a number of electrical connector pins 30, which connect via solder 34 to a corresponding number of wires 36. Typically, a bundle of four wires 36, each having Teflon insulation, comprise leadwire cable 40 traveling away from sensor 20 through port 42 of armature 46. Sensor 20 is mounted in a fixed, rigid manner within the tip 52 of the catheter 50. Catheter 50 has cable lumen 84 and amnio lumen 86. Leadwire cable 40 from sensor 20 travels through cable lumen 84 (figs. 2-6, 12a-c, and 13). Urion lacks a plurality of openings in the catheter wall with a sensor module disposed in each opening.

However, Wise et al. shows an ultraminiature catheter system 400 including a very small catheter 402 with two pressure sensors 30a and 30n, spaced apart by a predetermined distance 404. The pressure sensors 30a and 30n are each partially encapsulated in a biomedically compatible material 414 to seal off the hollow cylindrical interiors of the catheter system 400 from bodily fluids. The ends of the glass plates 32 of the sensors 30a and 30n are inserted into the catheter 402, leaving the silicon diaphragms 130 of each sensor 30a and 30n exposed for measurement (fig. 11). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to combine the catheter system of Wise et al. with the catheter system of Urion et al. to allow measurement at multiple sites using a single catheter, thereby allowing the collection of more information regarding the patient's status while minimizing discomfort to the patient and difficulty.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Urion et al. in view of Niederauer et al. Urion et al. describes an intrauterine pressure catheter system 10 with a pressure sensor 20 embedded in a tip 52 of a catheter 50. A suitable sensor 20 includes a piezoresistive strain gauge implant, thin-film temperature compensation element, and calibration element al integrated on a single monolithic, semiconductor die (substrate) 22 encased in housing 24. Sensor 20 has an orifice 26 protruding from the top of the housing 24 over die 22. Silicon dielectric gel 28 fills the orifice 26. A membrane (sealant) may be placed over orifice 26 to retain silicon gel 28. Leads 32 electrically connect die 22 to a number of electrical connector pins 30, which connect via solder 34 to a corresponding number of wires 36. Typically, a bundle of

four wires 36, each having Teflon insulation, comprise leadwire cable 40 traveling away from sensor 20 through port 42 of armature 46. Sensor 20 is mounted in a fixed, rigid manner within the tip 52 of the catheter 50 at vent hole 88. Catheter 50 has cable lumen 84 and amnio lumen 86. Leadwire cable 40 from sensor 20 travels through cable lumen 84 (figs. 2-6, 12a-c, and 13). Urion lacks electrical leads that are ribbons.

However, Niederauer teaches a device utilizing strain gauges 27, where the strain gauges 27 are connected to a probe electronics module 28 via ribbon cable, insulated wires, or any other means of transferring signals as is known in the art (fig. 11). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use ribbon cable in place of the insulted wires in the catheter system of Urion et al., since Niederauer et al. discloses that ribbon cable and insulated wire are functionally equivalent.

Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Urion et al. in view of Blackwell et al. Urion et al. describes an intrauterine pressure catheter system 10 with a pressure sensor 20 embedded in a tip 52 of a catheter 50. A suitable sensor 20 includes a piezoresistive strain gauge implant, thin-film temperature compensation element, and calibration element al integrated on a single monolithic, semiconductor die (substrate) 22 encased in housing 24. Sensor 20 has an orifice 26 protruding from the top of the housing 24 over die 22. Silicon dielectric gel 28 fills the orifice 26. A membrane (sealant) may be placed over orifice 26 to retain silicon gel 28. Leads 32 electrically connect die 22 to a number of electrical connector pins 30, which connect via solder 34 to a corresponding number of wires 36. Typically,

a bundle of four wires 36, each having Teflon insulation, comprise leadwire cable 40 traveling away from sensor 20 through port 42 of armature 46. Sensor 20 is mounted in a fixed, rigid manner within the tip 52 of the catheter 50. Catheter 50 has cable lumen 84 and amnio lumen 86. Leadwire cable 40 from sensor 20 travels through cable lumen 84 (figs. 2-6, 12a-c, and 13). Urion lacks a wire bond formed between the sensor module and each of the electrical leads.

However, Blackwell discloses that either solder balls or wire bonds may be used to mechanically and electrically connect the pads on the integrated circuit device 280 to the circuit lines 270 (fig. 1(g)). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a wire bond in place of the solder in the catheter system of Urion et al., since Blackwell et al. teaches that solder balls and wire bonds are functionally equivalent. Furthermore, since a ball bond is simply a type of wire bond, it would have been similarly obvious to substitute a ball bond for the solder in the catheter system of Urion et al.

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Urion et al. in view of St. Germain et al. Urion et al. describes an intrauterine pressure catheter system 10 with a pressure sensor 20 embedded in a tip 52 of a catheter 50. A suitable sensor 20 includes a piezoresistive strain gauge implant, thin-film temperature compensation element, and calibration element al integrated on a single monolithic, semiconductor die (substrate) 22 encased in housing 24. Sensor 20 has an orifice 26 protruding from the top of the housing 24 over die 22. Silicon dielectric gel 28 fills the orifice 26. A membrane (sealant) may be placed over orifice 26 to retain silicon gel 28.

Leads 32 electrically connect die 22 to a number of electrical connector pins 30, which connect via solder 34 to a corresponding number of wires 36. Typically, a bundle of four wires 36, each having Teflon insulation, comprise leadwire cable 40 traveling away from sensor 20 through port 42 of armature 46. Sensor 20 is mounted in a fixed, rigid manner within the tip 52 of the catheter 50. Catheter 50 has cable lumen 84 and amnio lumen 86. Leadwire cable 40 from sensor 20 travels through cable lumen 84 (figs. 2-6, 12a-c, and 13). Urion lacks a weld joint formed between the sensor module and each of the electrical leads.

However, St. Germain et al. discloses that either a solder or weld joint may be used to connect a hypotube 33 and extension wire 12 in a guidewire system (fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a weld joint instead of the solder joint in the catheter system of Urion et al., since St. Germain et al. teaches that the weld and solder joint are functionally equivalent.

Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Urion et al. in view of Pierson et al. Urion et al. describes an intrauterine pressure catheter system 10 with a pressure sensor 20 embedded in a tip 52 of a catheter 50. A suitable sensor 20 includes a piezoresistive strain gauge implant, thin-film temperature compensation element, and calibration element al integrated on a single monolithic, semiconductor die (substrate) 22 encased in housing 24. Sensor 20 has an orifice 26 protruding from the top of the housing 24 over die 22. Silicon dielectric gel 28 fills the orifice 26. A membrane (sealant) may be placed over orifice 26 to retain silicon gel 28.

Leads 32 electrically connect die 22 to a number of electrical connector pins 30, which connect via solder 34 to a corresponding number of wires 36. Typically, a bundle of four wires 36, each having Teflon insulation, comprise leadwire cable 40 traveling away from sensor 20 through port 42 of armature 46. Sensor 20 is mounted in a fixed, rigid manner within the tip 52 of the catheter 50 such that orifice 26 remains exposed. Catheter 50 has cable lumen 84 and amnio lumen 86. Leadwire cable 40 from sensor 20 travels through cable lumen 84 (figs. 2-6, 12a-c, and 13). Urion lacks a weld joint formed between the sensor module and each of the electrical leads.

However, Pierson et al. discloses solder or a conductive adhesive as a suitable connection between a metallization feature 13 on the surface of an integrated circuit chip 11 and a bonding pad 16 on another surface 16, such as another chip, card, substrate, or module (fig. 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a conductive adhesive joint instead of the solder connection in the catheter system of Urion et al., since Pierson et al. teaches the functional equivalence of solder and conductive adhesive.

Allowable Subject Matter

Claim 26 is allowed.

Claims 6,10, 12, 14-21, and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6,264,612 to McConnell et al.

U.S. Patent No. 6,019,729 to Itoigawa et al.

U.S. Patent No. 4,685,469 to Keller

U.S. Patent No. 4,559,951 to Dahl

"Chapter A: Wire Bonding" by Lai et al.

"Glossary of Terms & Acronyms Used in Surface Engineering" by Mattox

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia C. Mallari whose telephone number is (703) 605-0422. The examiner can normally be reached on Mon-Fri 9:30 am-7:00 pm (alternate Fri. off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Max F. Hindenburg can be reached on (703) 308-3130. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-8117 for regular communications and (703) 305-3590 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0858.

Robert L. Nasser

ROBERT L. NASSER
PRIMARY EXAMINER

pcm
March 23, 2003

Patricia Mallari